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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,718	04/13/2006	Mitsuhiro Iga	1774-0119PUS1	3533

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EXAMINER	
LAM, HUNG Q	

ART UNIT	PAPER NUMBER
2883	

NOTIFICATION DATE	DELIVERY MODE
07/02/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/575,718	IGA ET AL.	
	Examiner	Art Unit	
	Hung Lam	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

Claims 1-22 are pending in this application.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on April 13, 2006 was filled in compliance with the provisions of 37 CFR 1.97. The examiner is considering the information disclosure statement.

If applicant is aware of any prior art or any other co-pending application not already of record, he/she is reminded of his/her duty under 37 CFR 1.56 to disclose the same.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in Application No. 10/575,718, filed on April 13, 2006.

Drawings

The drawings submitted on April 13, 2006 are accepted as part of the formal application.

Specification

The specification is accepted as part of the formal application.

Applicant cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 5, 9-10, 16, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Watanabe et al.** (US. Pat. 6,449,400) in the view of **Chang** (US. Pub. 2003/0133654).

Regarding claims 1-2, 5, 9-10, and 16, Watanabe et al. discloses an optical fiber and sensor system comprising the following such as:

- a mode restriction releasing means including an optical fiber portion 2, a sensor element 3 (light permeable member or a hetero core) has core 31 with a diameter

that differs from the core 21 of the optical fiber portion 2 and also is shorter than the optical fiber portion 2, which is fusing or melt bonded to the optical fiber portion 2, guiding at least a portion of the light transmitted by the optical fiber portion 2 to the outside of a core 31 to release the restriction of the mode of the light (back-scattered light), and returning the light released in the restriction of the mode into the core 31 and 21 (col. 1 lines 57-65, col. 2 lines 9-18, col. 3 lines 37-44, and Fig. 1 and 5).

- a light source (light pulses) which is controlled by an operating unit 12 that connected to the optical fiber portion side end of the optical fiber sensor and emitting light to the core of the optical fiber sensor (col. 4 lines 36-41, and Fig. 1).
- a display unit 11 or a light detecting means for the detecting direct intensity of returned light returning to the light source side via the core of the sensor element 3 and the optical portion 2 (col. 5 lines 20-50, and Fig. 1).

FIG. 1

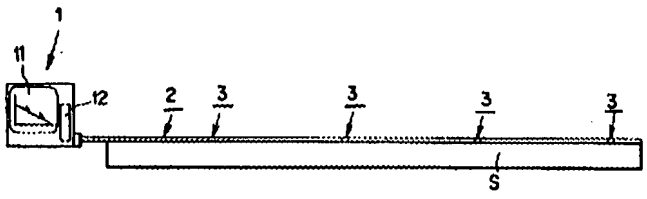
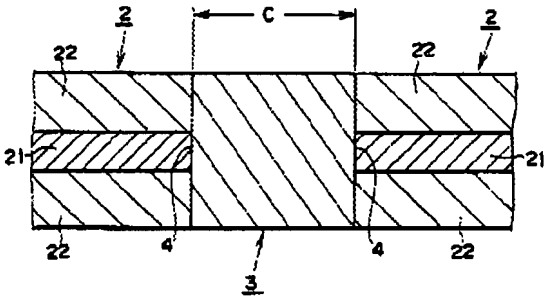


FIG. 5



Reproduced from US. Pat. 6,449,400.

However, **Swift et al.** only teach that the light permeable member or the sensor element 3 that is fusing or melt bonded to the optical fiber portion 2 **but not to** the front end of the optical fiber portion 2.

Chang teaches an optical fiber collimator including a single mode fiber 11 (optical fiber portion) and a multi mode fiber 12 (light permeable member) that spliced fusing to the front end of the single mode fiber ([0020], and Fig. 2A).

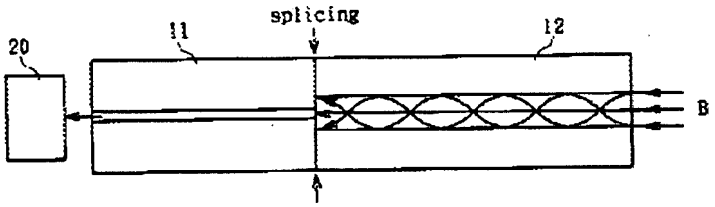


FIG. 2A

Reproduced from US. Pub. 2003/0133654.

It would have been obvious to the one having ordinary skill in the art at the time the invention was made to use the teachings of **Chang** to modify the optical fiber sensor of **Watanabe et al.** as to have the multi mode fiber 12 (light permeable member) that spliced fusing to the front end of the single mode fiber 11 (optical fiber portion). The motivation for doing so is because this teaching provides a method of fabricating the optical fiber collimator/sensor "...where the collimator occupies a smaller space, which suits optical devices having a smaller volume." (Chang, [0007], [0029]).

Regarding claim 22, in accordance with the rejection of claim 9, **Watanabe et al.** and **Chang** further disclose a OTDR unit 1 includes a measuring means for measuring a predetermined characteristic of an environment outside of said optical fiber sensor 2 based on an intensity of said returned light detected by said OTDR light detecting means 1 (Wantanabe et al. "abstract", col. 6 lines 15-17, and Fig. 7).

Claims 3-4, 6, 12-13, and 18-19 **are** rejected under 35 U.S.C. 103(a) as being unpatentable over **Watanabe et al.** (US. Pat. 6,449,400) and **Chang** further in the view of **Watanabe et al.** (JP. Pub. 2002-350335).

Regarding claims 3-4, 6, 12-13, and 18-19, in accordance with the rejection of claims 1, 9 and 16, **Watanabe et al.** and **Chang** further disclose that the claimed invention **except** for the following such as a metal film provided at a surface side of said hetero core and generating surface plasmon by reflection of light in the hetero core at that surface, and a reflection means for reflecting light in the hetero core and returning the to said optical fiber portion side opposite to hetero core at the end melt bonded end position.

Watanabe et al. (JP. Pub. 2002-350335) teach an optical fiber and sensor system including the following such as a metal film 17 provided at a surface side of said hetero core 14 and generating surface plasmon, and the metal thin film 17 is formed in the front face in the interface 19 of the hetero core 14 that reflected the light in the hetero core 14 and returning the light to the optical fiber portion 11("abstract", [0012], [0028], Fig. 2)

It would have been obvious to the one having ordinary skill in the art at the time the invention was made to use the teachings of **Watanabe et al.** (JP. Pub. 2002-350335) to modify the optical fiber sensor of **Watanabe et al.** and **Chang** as to provide a metal thin film to the surface of the hetero core for generating surface plasmon, and a reflection means for reflecting light in the hetero core and returning the light to the optical fiber portion. The motivation for doing so as to "...provide a refractive index sensor which has a simple structure...and can easily and accurately measure a refractive index of a desired sample" (Wantanabe et al. JP. Pub. 2002-350335, "abstract").

Claims 8, 11, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Watanabe et al.** and **Chang** further in the view of **Murphy et al.** (US. Pat. 4,894,532).

Regarding claims 8, 11, 17, in accordance with the rejection of claims 1, 5, 9 and 16, **Watanabe et al.** and **Chang** further disclose that the claimed invention **except** for a reflecting means for reflecting light in the hetero core and returning the light to said optical fiber portion side at the surface of the end of the hetero core opposite to the end melt bonded to the optical fiber portion.

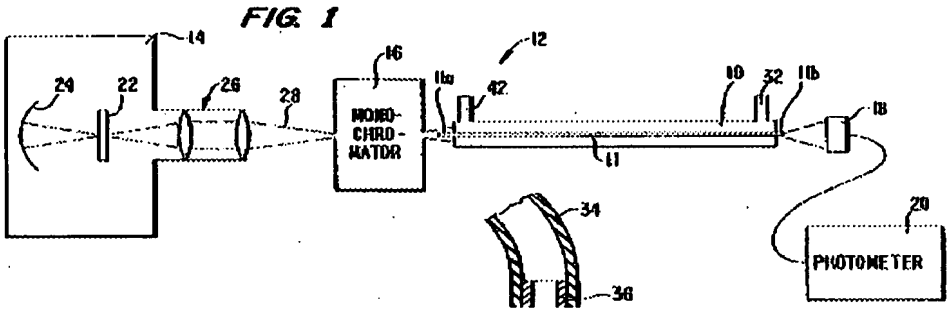
Murphy et al. teach an optical fiber interferometer including a reflection film 22 at the end face of the sapphire fiber 14 or hetero core (col. 5 lines 31-34, and Fig. 2).

It would have been obvious to the one having ordinary skill in the art at the time the invention was made to use the teachings of **Murphy et al.** to modify the optical fiber sensor of **Watanabe et al.** and **Chang** as to include a reflection film 22 at the end face of the hetero core. The motivation for doing so as an optional choice of designing "...to improve the second reflection from the end face of the sapphire fiber 14..." (Murphy et al. col. 5 lines 31-34, and Fig. 2).

Claims 4, 7, 14-15, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Watanabe et al.** and **Chang** further in the view of **Peterson et al.** (US. Pat. 5,381,229).

Regarding claims 4, 7, 14-15, and 20-21, in accordance with the rejection of claims 1, 9 and 16, **Watanabe et al.** and **Chang** further disclose that the claimed invention **except** for the limitation of a detection chemical selectively reacting with a detection object at the outside of said hetero core and giving a change in accordance with that reaction to the light in the hetero core is immobilized at a surface side of said hetero core.

Peterson et al. disclose an optical fiber sensor having a coating of thin film 16 of plasma polymerized hexamethyldisiloxane and ammonia to the sensor rod 11 to detect the change in the light transmission characteristic as function of moisture conditions in an environment to which the coating is exposed ("abstract", col. 4 lines 20-23, and Fig. 1).



Reproduced from US. Pat. 5,381,229.

It would have been obvious to the one having ordinary skill in the art at the time the invention was made to use the teachings of **Peterson et al.** to modify the optical fiber sensor of **Watanabe et al.** and **Chang** as to provide a coating (detection chemical) to the hetero core in order to detect the change in accordance with that reaction to the light in the hetero core is immobilized at a surface side of said hetero core. The motivation for doing so as to implement an optical fiber sensor for a new application of sensing such that "...is provided for sensing changes in moisture conditions in an environment..." (Peterson et al. col. 2 lines 44-46)

Cited Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chang et al. (US. Pat. 5,361,383),

Andrews et al. (US. Pat. 5,477,323),

Liu (US. Pat. 6,020,207).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Lam whose telephone number is 571-272-9790. The examiner can normally be reached on M - F 07:30 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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